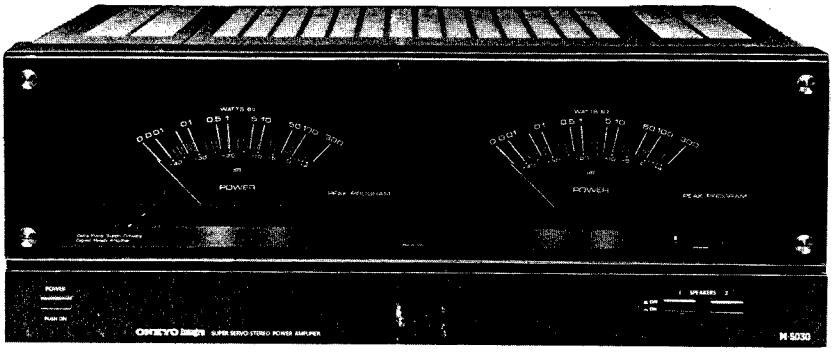
ONKYO® SERVICE MANUAL

SUPER SERVO STEREO

POWER AMPLIFIER

MODEL M-5030



UDN, UD	120V AC, 60Hz
UGV, UG	220V AC, 50Hz
UW	120V or 220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLICANCE TO THE CUSTOMER.

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ONKYO®
AUDIO COMPONENTS

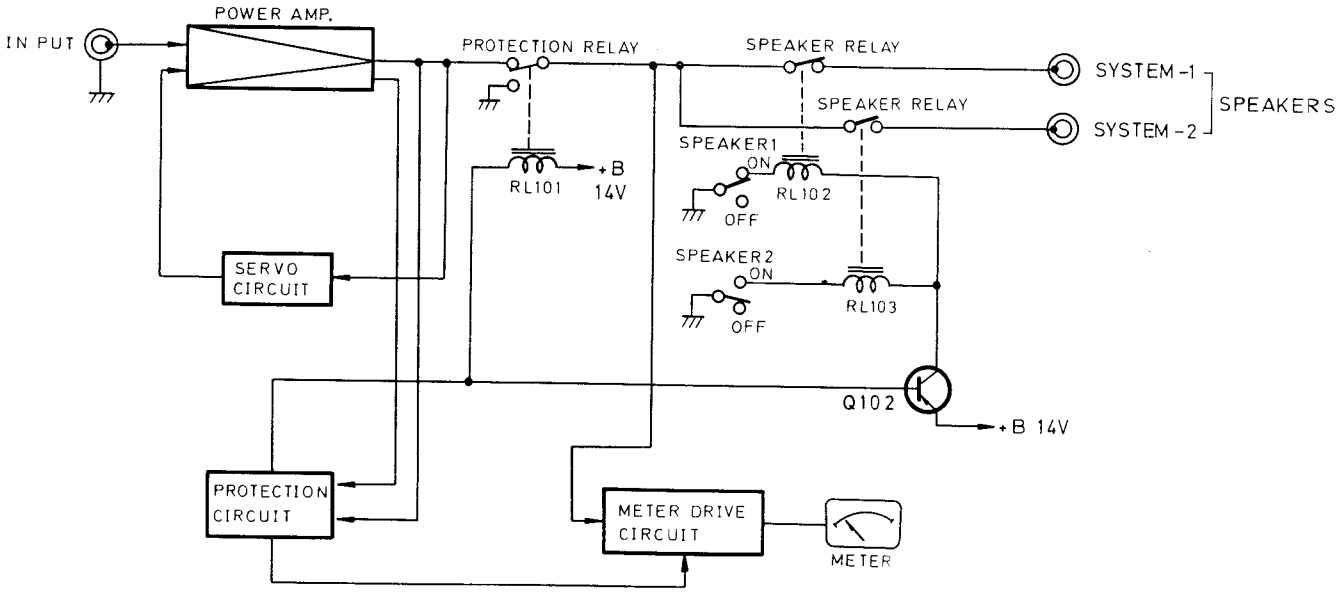
SPECIFICATIONS

Power Output:	100 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20 Hz to 20 kHz, with no more than 0.005% total harmonic distortion.
Total Harmonic Distortion:	0.005% at Rated power 0.005% at 1 watt output
Intermodulation Distortion:	0.005% at Rated power
Frequency Response:	+0, −1.5 dB at 1 Hz ~ 100 kHz
Input Sensitivity:	1 V
Input Impedance:	47 kΩ
Damping Factor:	100 (8Ω, 1 kHz)
Signal to Noise Ratio:	94 dB (IHF A-202)
Power Supply:	U.S. & Canadian model AC 120V, 60 Hz European model AC 220V, 50 Hz Universal model AC 120V/220V, 50/60 Hz

Outputs:	SPEAKERS 1 & 2, AC OUTLET (U.S. & Canadian models only)
Inputs:	INPUT
Semiconductors:	8 FETs, 39 Transistors, 44 Diodes, 6 ICs
Dimensions:	450(W) x 174(H) x 417(D) mm (17-3/4" x 6-7/8" x 16-5/8")
Weight:	17.2 kg (37.8 lbs.)

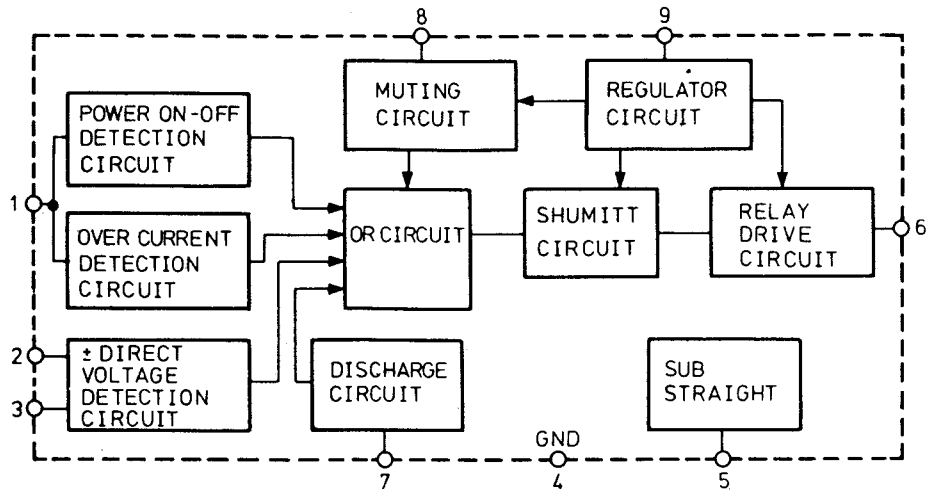
Specifications and features are subject to change without notice.

BLOCK DIAGRAM

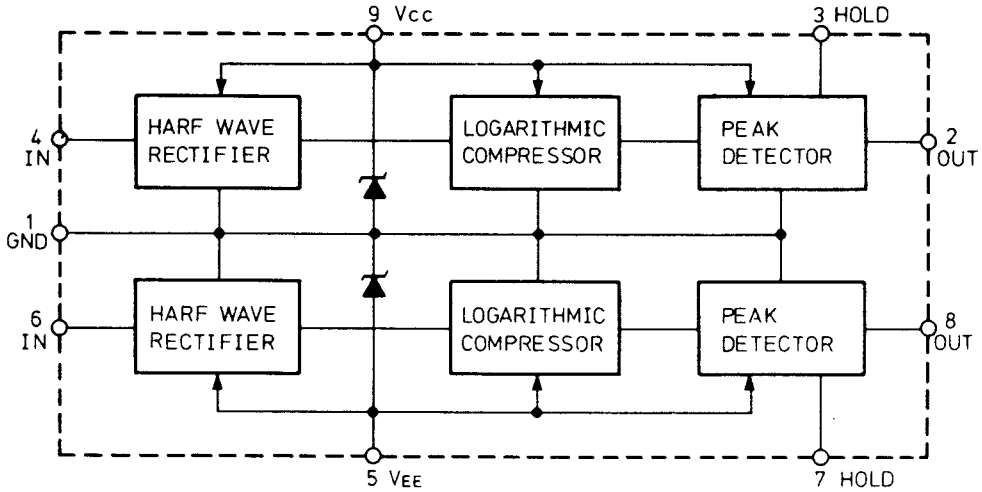


IC BLOCK DIAGRAM

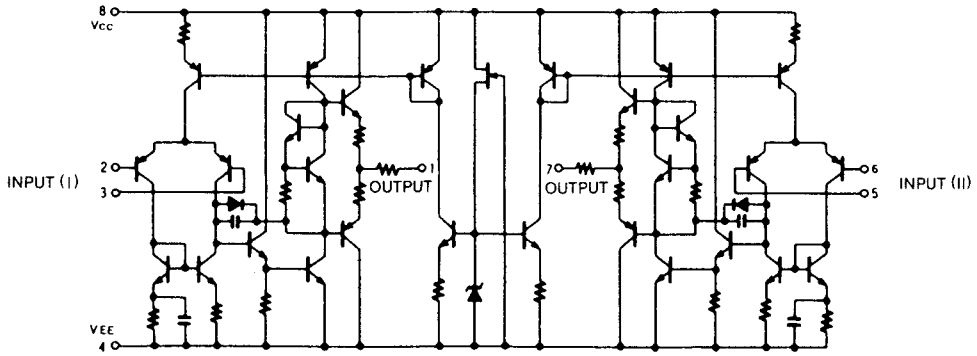
TA7317P



TA7318P



NJM4558DX



PRECAUTIONS

1. Precautions

For continued protection against risk of fire, replace only with same type and same rating fuse.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
F101, F102	252050	5A ST-6, Primary fuse (120V model)
F101, F102	252057	5A-TL, Primary fuse (120V/220V model)
F103, F104	252076	3.15A-SE-EAK, Primary fuse (220V and 120V/ 220V model)
F111-F114	252078	5A-SE-EAK, Secondary fuse (120V/220V model)
F121, F122	252045	1A ST-6, Secondary fuse (120V model)
	252070	1A-SE-EAK, Secondary fuse (220V model)
	252062	TLC-1A, Secondary fuse (120V/220V model)

2. Replacing the lamps

This unit used the lamps listed below.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL701	210085	PL14V60mAW-2.6, Protection lamp
PL702, PL703	210086	PL14V60mAW-0.9, Speaker lamps
PL801, PL802 PL901, PL902	210092	PL14V150mA, Meter lamps

3. Insulation resistance mesurement

Connect the insulating-resistance tester between the plug of power supply cable and the terminal GND on the back panel.

Specifications; 500V more than 10MΩ

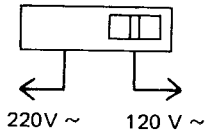
4. Voltage Selector (Rear Panel)

Some models are equipped with a voltage selector to conform with local power supplies.

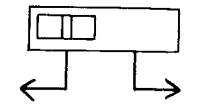
Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

If there is no voltage selector switch on the unit you have purchased, it can only be used in areas where the power supply voltage is the same as that of the unit.

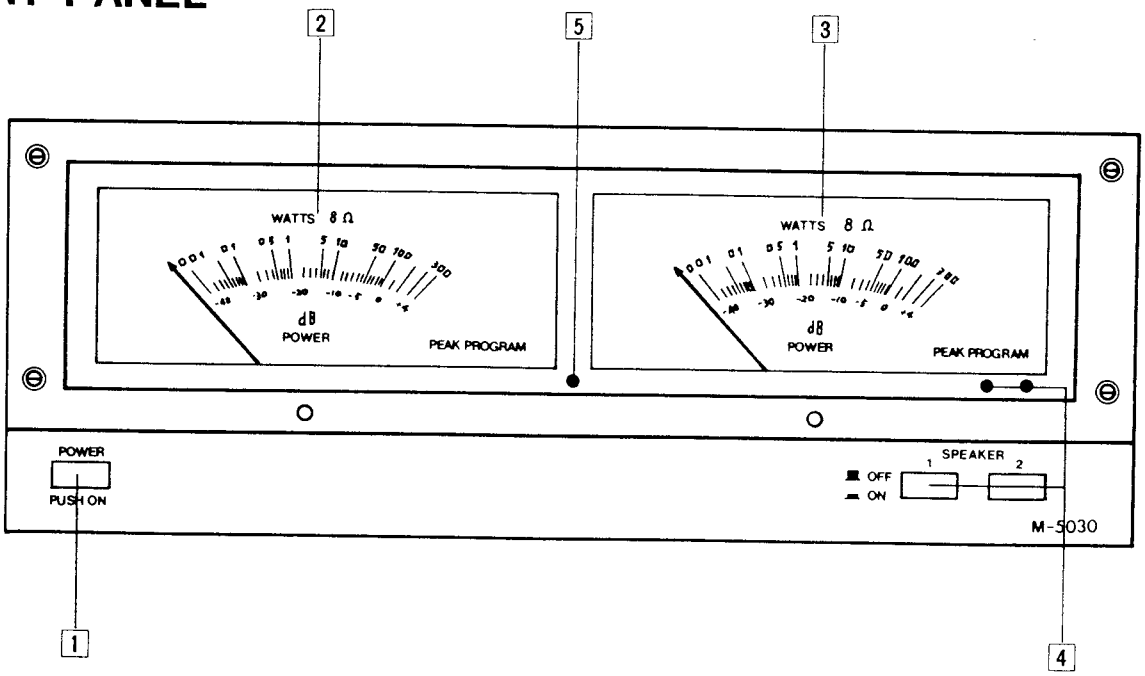


at AC 120 V



at AC 220 V

FRONT PANEL



1. Power switch
2. Left channel power meter
3. Right channel power meter
4. Speaker selector and indicators
5. Protection indicator

ADJUSTMENT PROCEDURES

1. **Preparations**
   a) Place the unit on a level surface, right side up, leaving at least 15 mm of space at the ventilation openings.
   b) There should be no load or signal and the level should be at minimum.
   c) The air should be calm, as moving air can upset the stability of the gauges.

2. **Meter zero point**
   With the power off, align each needle with the 0 mark using the adjustment screw underneath each meter.

   Caution: Do not perform this adjustment immediately after turning the power off. Perform after the meter circuit section has discharged.

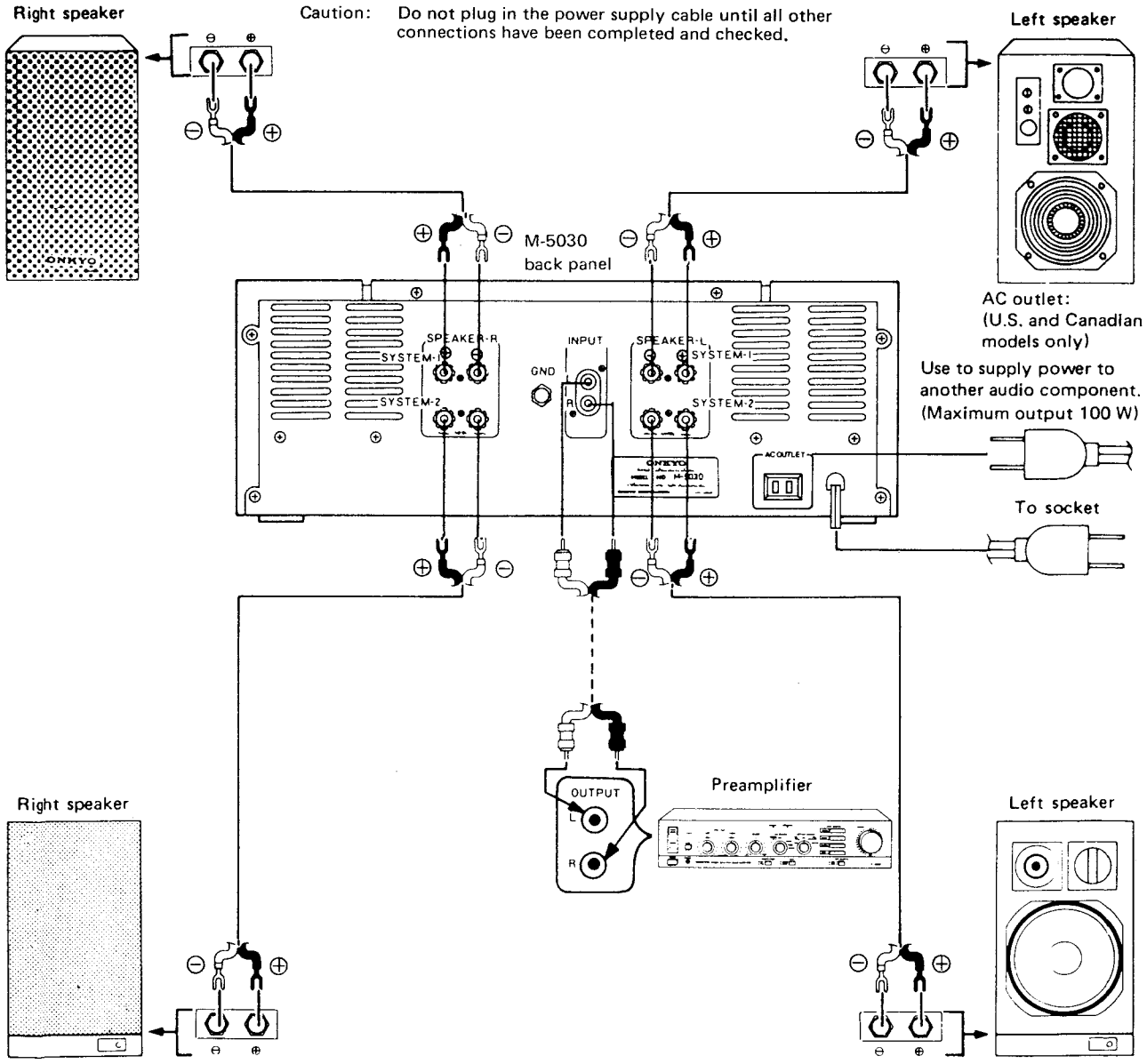
3. **Idling current**
   Remove the cover and, five minutes after the power has been turned on, adjust the semi-fixed resistor R441 (R541) so that the voltage between V_{CT}-I_{ID} on printed circuit board NAMA-1780 is 14 mV.

4. **Meter offset**
   About five minutes after turning power on and with no signal present, adjust the semi-fixed resistor R639 (R640) on the printed circuit board NAME-1717 to align each meter needle with 0.

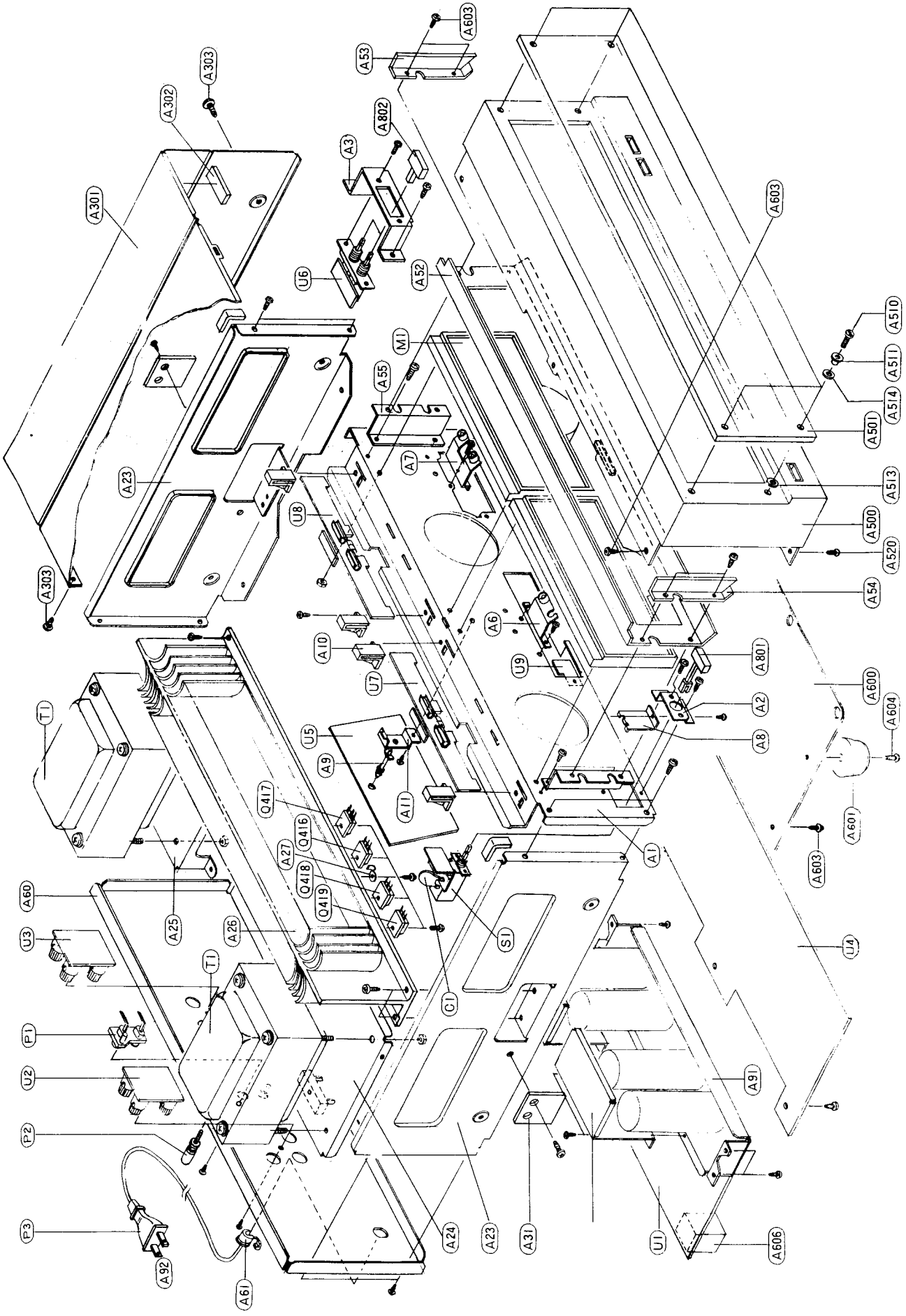
5. **Meter level adjustment**
   a) Apply a 1 kHz input signal to the left (right) channel INPUT terminal.
   b) Adjust the input so that the voltage at the speaker output terminal (under no load) is 28.28V (29.03 dBV).
   c) Adjust R611 (R612) so that the meter reads 0dB.

   Caution: Item in parentheses are for the right channel.

SYSTEM CONNECTIONS



EXPLODED VIEW



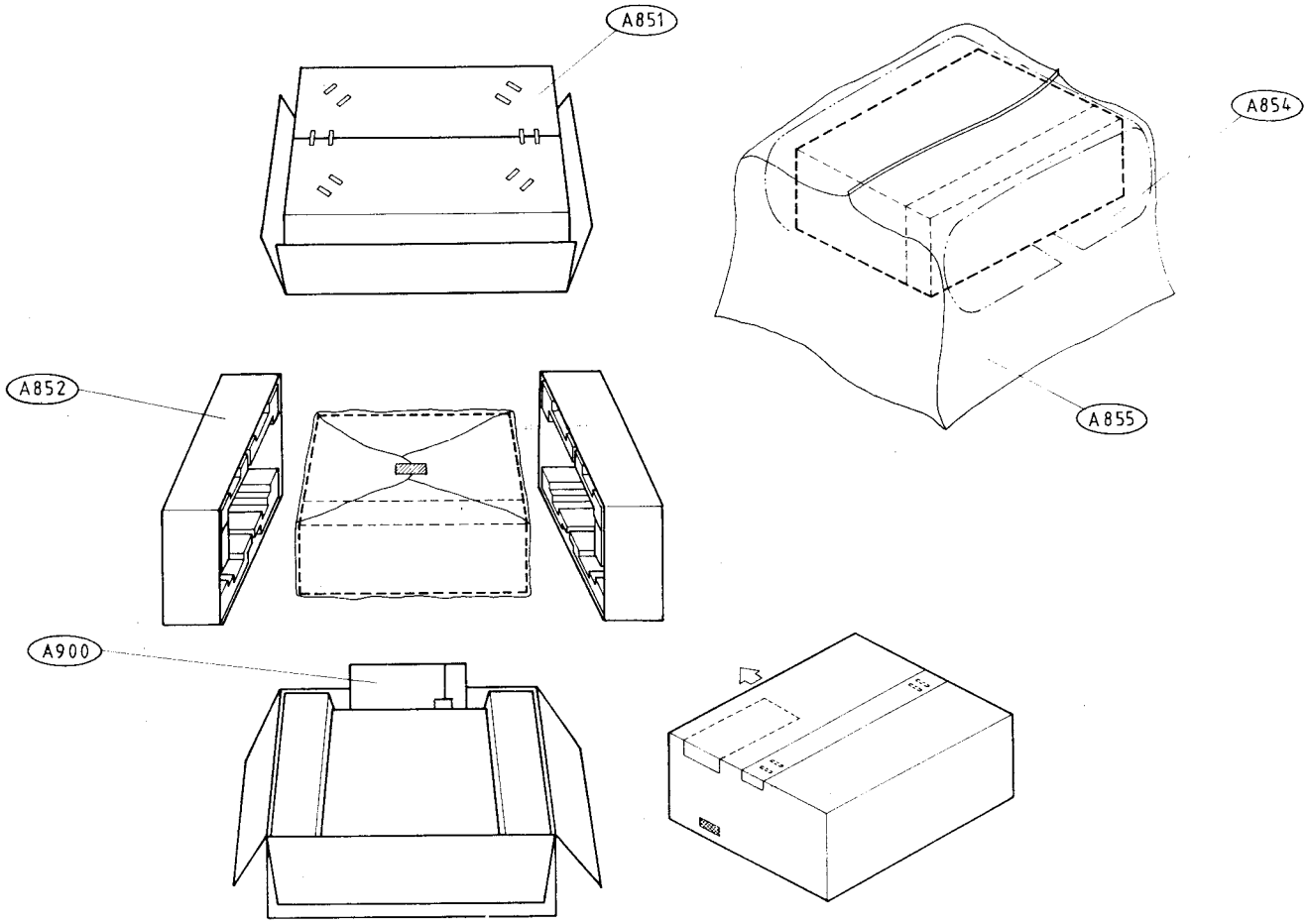
PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
A1	27110200	Front bracket
A2	27140313	Bracket, power switch
A3	27140796	Bracket, Push switch
A6	27140553	Bracket, lamp
A7	27140797	Bracket, lamp
A8	27140317	Bracket, holder, pc
A9	27190011	LCBS-6N, Holder
A10	27190127	Holder, pc
A11	27140798A	Bracket, pc
A23	27115053B	Side bracket
A24	27130172A	Bracket, power transformer, left
A25	27130173A	Bracket, power transformer, right
A26	27160097B	Heatsink
A27	27140376B	Bracket, transistor
A31	27270041	Plate
A52	12238128	Back plate ass'y
A53	28125096B	End cap, right
A54	28125097B	End cap, left
A55	27140555	Bracket
A60	27120511	Back panel (D)
	27120512	Back panel (G)
	27120513	Back panel (W)
A61	270280	SR-4K-4, Strainrelief
A91	27130334	Bracket
A92	27130335	Bracket
A301	28184120-1	Top cover
A302	28140020	4 x 10 x 40 mm, Cushion
A303	838440089	4TTB+8C(BC), Screw
A500	12238121	Front panel ass'y
A501	28191098	Clear plate
A510	27300348	Screw
A511	27270017B	Spacer
A512	86214010	WN4 x 10FN, Nut
A513	870105	Washer
A514	870054A	Washer
A520	834430068	3TTS+6B(BC), Tapping screw
A600	27170067	Bottom board
A603	831430088	3TTW+8B(BC), Tapping screw
A604	831130168	3TTW+16B, Tapping screw
A610	280889B	Leg
A801	28320634A	Knob, Power
A802	28320646	Knob, Push
Q413, Q513	2211255	2SC1815 (GR), Transistors
Q416, Q417	2201164 or	2SC2581 (Y) or
Q516, Q517	2201163	2SC2581 (O), Transistors
Q418, Q419	2201154 or	2SA1106 (Y) or
Q518, Q519	2201153	2SA1106 (O), Transistors
D404, D405	4000068	VD1222, Diodes
⚠ T1, T2	230726	NPT-814D, Power transformers (D)
	230727	NPT-814G, Power transformers (G)
	230728	NPT-814DG, Power transformers (W)
⚠ C1, C2, C3	3500065A	0.01μF, AC 400V, Capacitors IS
⚠ C1a, C2a, C3a	27300601	SB-1925, Capacitor covers
C5, C6	372123305	33pF, 50V, Capacitor, polystyren
⚠ S1	25035381	NPS-121-L345P, Power switch (D) (W)
	25035015A	NPS-111LA3, Power switch (G)
⚠ S2	25065109	NSS-2255P, Voltage selector switch (W)
P1	25045047	NPJ-2PRBL22, Input terminal
P2	TP160B	Ground terminal
⚠ P3	253100	AS-UC-4, Power supply cable (D)
	253092-1	AS-CEE-2, Power supply cable (G)(W)
⚠ P4	25050046	NSCT-2P15, AC outlet (D)
	25108010	LG-2C, Terminal (G)(W)
M1, M2	243145	NIND-2000S145, Power meter
⚠ F101, F102	252050	5A ST-6, Primary fuse (D)
	252057	5A-TL, Primary fuse (W)
F103, F104	252076	3.15A-SE-EAK, Primary fuse (G) (W)
F111-F114	252078	5A-SE-EAK, Secondary fuse (G)
⚠ F121, F122	252045	1A ST-6, Secondary fuse (D)
	252070	1A-SE-EAK, Secondary fuse (G)
	252062	TLC-1A, Secondary fuse (W)
U1	12238513	NAPS-1713, Protector/ Power supply pc board ass'y (D)
	12244513A	NAPS-1713a, Protector/ Power supply pc board ass'y (G)
	12240513B	NAPS-1713b, Protector/ Power supply pc board ass'y (W)
U2	12238514	NA0P-1714, Speaker terminal pc board ass'y (D) (W)
	12244514A	NA0P-1714a, Speaker terminal pc board ass'y (G)
U3	12238515	NA0P-1715, Speaker terminal pc board ass'y (D) (W)
	12244515A	NA0P-1715a, Speaker terminal pc board ass'y (G)
U4	12238580	NAMA-1780, Power amplifier pc board ass'y
U5	12238517	NAME-1717, Meter drive circuit pc board ass'y
U6	12238518	NASW-1718, Speaker switch pc board ass'y
U7	12238519	NAPL-1719, Meter lamp pc board ass'y
U8	12238520	NAPL-1720, Meter lamp pc board ass'y
U9	12238521	NARB-1721, Temperature correction pc board ass'y

Note: (D): Only 120V model
(G): Only 220V model
(W): Only 120V/220V model

The components identified by mark ⚠ are critical for risk of fire and electric shock. Replace only with parts number specified.

PACKING PROCEDURES



PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
A851	29050780	Master carton box
A852	29090628A	Pad
A854	290093-1	500 x 1200 mm, Protection sheet
A855	29100038A	720 x 950 mm, Poly bag
A900	**Accessary bag**	
	29340706	Instruction manual (D) (U)
	29340707	Instruction manual (G) (W)
	29365006-4	Warranty card (U)
	29365005-3	Warranty card (V)
	29358002	Service station list (U)
	29360657	Label, Top cover (U)
	29365010	Label, Bottom board (U)
	29100006	350 x 250 mm, Poly bag
	2010069	Connection cord
	29355060	Caution sheet
	29355093	Caution sheet (V)
	25055018	CV-K-1, Conversion plug (W)

Note: (U): Only U.S.A. model
(V): Only West Germany model
(D): Only 120V model
(G): Only 220 model
(W): Only 120V/220V model

PRINTED CIRCUIT BOARD PARTS LIST

PROTECTOR/POWER SUPPLY PC BOARD (NAPS-1713/NAPS-1713a/NAPS-1713b) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	IC	
Q101	222584	TA7317P
	Transistor	
Q102	2211504	2SA950(Y)
	Diodes	
D101-D112	223841	GP30G
D113, D114	223862	WL01
D120	2240973	GZA6.2Z
D121, D122 D124, D125	223145	1S2076TD
	Coils	
L101, L102	231016	S-0.8D
	Capacitors	
C101-C104	3504174	15000μF, 69V, Elect.
C107, C108	379134735	0.047μF, 100V, DEW
C109, C110	352722219	220μF, 6.3V, Elect.
C113	352784799	0.47μF, 50V, Elect.
C114	352744719	470μF, 16V, Elect.
C115	352742229	2200μF, 16V, Elect.
C117	352732209	22μF, 10V, Elect.
C119-C122	379131047	0.1μF, 100V, DEW
	Resistors	
R101, R102	441620474	4.7Ω, 1W, Metal oxide film
R107, R108	441721004	10Ω, 2W, Metal oxide film
R121-R124	441520334	3.3Ω, 1/2W, Metal oxide film
	Relaies	
RL101	25065124	NRL-4P3A-DC12-04
RL102, RL103	25065036	NRL-4P3A-DC12-01
	Fuseholder	
F101a, F102a F121a, F122a	250113	S-N5051 (NAPS-1713 and NAPS-1713b only)
F103a, F104a	25050065	YSH403T (NAPS-1713 and NAPS-1713b only)
F111a-F114a F121a, F122a	25050005	YSH403T (NAPS-1713a only)
	Plug	
	25055114	NPLG-6P98
	Plates	
	27300605	
	Bracket	
A91	27130334	
A92	27130335	

SPEAKER TERMINAL PC BOARD (NAOP-1714, NAOP-1715) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	25060039	NTM-4PDMN10, Terminal

SPEAKER TERMINAL PC BOARD (NAOP-1714a, NAOP-1715a) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
C201, C202 C301, C302	379131027	1000pF, 100V, Capacitors DEW
	25060039	NTM-4PDMN10, Terminal

METER DRIVE CIRCUIT PC BOARD (NAME-1717) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q603	222529	TA7318P (R)
Q606, Q607	222502	NJM4558DX
	Transistors	
Q601, Q602	2211945	2SK246 (GR)
Q604, Q605	2211255	2SC1815 (GR)
Q608	2200664	2SC1626 (Y)
Q609	2200674	2SA816 (Y)
Q610	2211164	2SC2120 (Y)
	Diodes	
D601, D602 D605, D609 D610	223145	1S2076TD
D603, D604 D606	2241151	GZA15X
D607, D608	2241233	GZA22Z
	Lamp	
PL701	210085	PL14V 60mA W-2.6
	Capacitors	
C601, C602	352784799	0.47μF, 50V, Elect.
C605, C606 C610, C611	352780339	3.3μF, 50V, Elect.
C607	352780109	1μF, 50V, Elect.
C608, C609	379121035	0.01μF, 50V, DEW
C612, C613 C618, C619	352754709	47μF, 25V, Elect.
C614, C615	352752219	220μF, 25V, Elect.
	Resistors	
R611, R612	5221024	N10HR1KBEM, Semi-fixed
R639, R640	5221023	N10HR470BEM, Semi-fixed
R644	441522224	2.2kΩ, 1/2W, Metal oxide film
R645	441523924	3.9kΩ, 1/2W, Metal oxide film
R646, R647	441524714	470Ω, 1/2W, Metal oxide film
R649	441622724	2.7kΩ, 1W, Metal oxide film
R659	441527504	75Ω, 1/2W, Metal oxide film
R661	441720334	3.3Ω, 2W, Metal oxide film
	Relay	
RL601	25065048	FRL-644D12/2AS
	Sockets	
	2000247	NSAS-6P185

SPEAKER SWITCH PC BOARD (NASW-1718) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL702, PL703	210086	PL14V 60mA W-0.9, Lamps
R711, R712	442527504	75Ω, 1/2W, Metal oxide film
S702, S703	25035393	NPS-222-L357, Switches

METER LAMP PC BOARD (NAPL-1719) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL801, PL802	210092	PL14V 150mA, Lamps
	27140552	Bracket, lamp

METER LAMP PC BOARD (NAPL-1720) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL901, PL902	210092	PL14V 150mA, Lamps
	27140552	Bracket, lamp

TEMPERATURE CORRECTION PC BOARD (NARB-1721) PARTS LIST

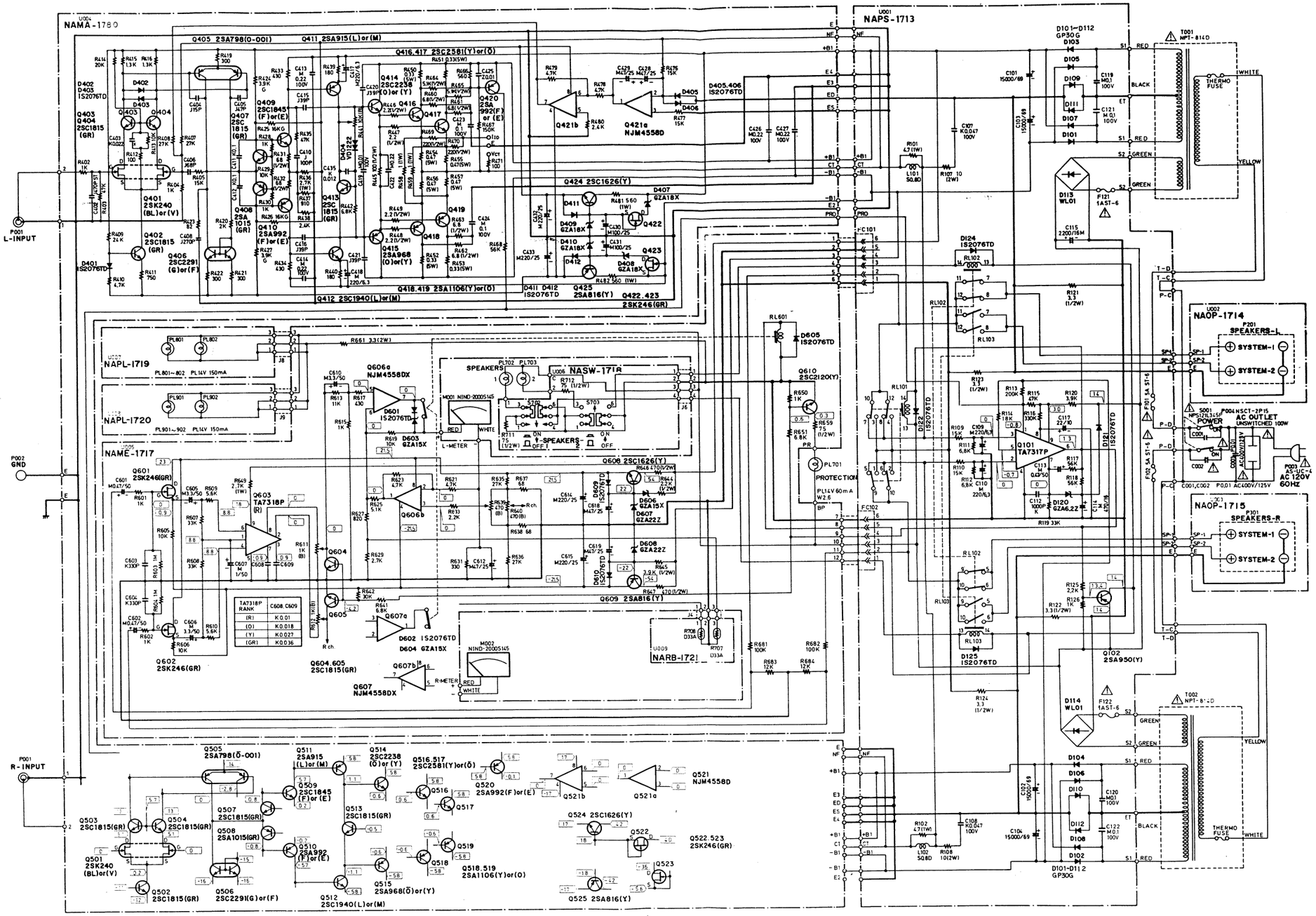
CIRCUIT NO.	PARTS NO.	DESCRIPTION
R730, R731	4000028	D33A, Thermistors

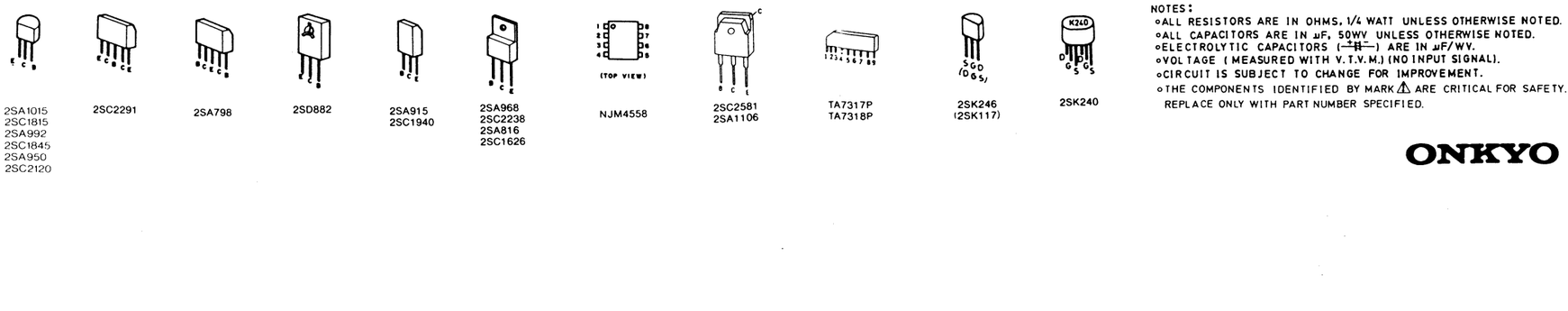
POWER AMPLIFIER PC BOARD (NAMA-1780) PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistors	
Q401, Q501	2211916 or	2SK240 (BL) or
	2211917	2SK240 (V)
Q402-Q404	2211255	2SC1815 (GR)
Q502-Q504		
Q407, Q507		
Q405, Q505	2211140	2SA798 (0-001)
Q406, Q506	2211446 or	2SC2291 (G) or
	2211445	2SC2291 (F)
Q408, Q508	2211455	2SA1015 (GR)
Q409, Q509	2211732 or	2SC1845 (F) or
	2211733	2SC1845 (E)
Q410, Q510	2211792 or	2SA992 (F) or
Q420, Q520	2211793	2SA992 (E)
Q411, Q511	2211742 or	2SA915 (L) or
	2211743	2SA915 (M)
Q412, Q512	2211762 or	2SC1940 (L) or
	2211763	2SC1940 (M)
Q414, Q514	2200863 or	2SC2238 (O) or
	2200864	2SC2238 (Y)
Q415, Q515	2200873 or	2SA968 (O) or
	2200874	2SA968 (Y)
Q422, Q522	2211945 or	2SK246 (GR) or
Q423, Q523	2211315	2SK117 (GR)
Q424, Q524	2200664	2SC1626 (Y)
Q425, Q525	2200674	2SA816 (Y)
	ICs	
Q421, Q521	222465	NJM4558D
	Diodes	
D401-D403	223145	1S2076TD
D405, D406		
D411, D412		
D501-D503		
D505, D506		
D511, D512		
D407-D410	2241191	GZA18X
D507-D510		
	Capacitors	
C402, C502	372124714	470pF, 50V, Polystyren
C403, C503	379122235	0.022μF, 50V, DEW
C411, C412	379121045	0.1μF, 50V, DEW
C511, C512		
C413, C414	379132247	0.22μF, 100V, DEW
C426, C427		
C513, C514		
C526, C527		
C419, C519	379221037	0.01μF, 50V, DEW
C422, C522	379122247	0.22μF, 50V, DEW
C423, C424	379131047	0.1μF, 100V, DEW
C523, C524		
C435, C535	379121235	0.012μF, 50V, DEW
	Resistors	
R431, R432	441526804	68Ω, 1/2W, Metal oxide film
R531, R532		
R436, R536	441622724	2.7kΩ, 1W, Metal oxide film
R441, R541	5225074	N10HR10KBDM, Semi fixed
R445, R545	441521014	100Ω, 1/2W, Metal oxide film
R446-R449	441520224	2.2Ω, 1/2W, Metal oxide film
R546-R549		
R450-R453	4000078	0.33Ω, 5W, Metal Plate
R550-R553		
R454-R457	4000080	0.47Ω, 5W, Metal Plate
R554-R557		
R458, R459	441620104	1Ω, 1W, Metal oxide film
R558, R559		
R460-R463	441520684	6.8Ω, 1/2W, Metal oxide film
R560-R563		
R464, R465	441525124	5.1kΩ, 1/2W, Metal oxide film
R564, R565		
R469, R470	441522214	220Ω, 1/2W, Metal oxide film
R569, R570		
R481, R482	441625614	560Ω, 1W, Metal oxide film
R581, R582		
	Radiators	
	27160029	RAD-07

SCHEMATIC DIAGRAM

120V model





NOTES:

- ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS ($\frac{\text{μF}}{\text{WV}}$) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M.) (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

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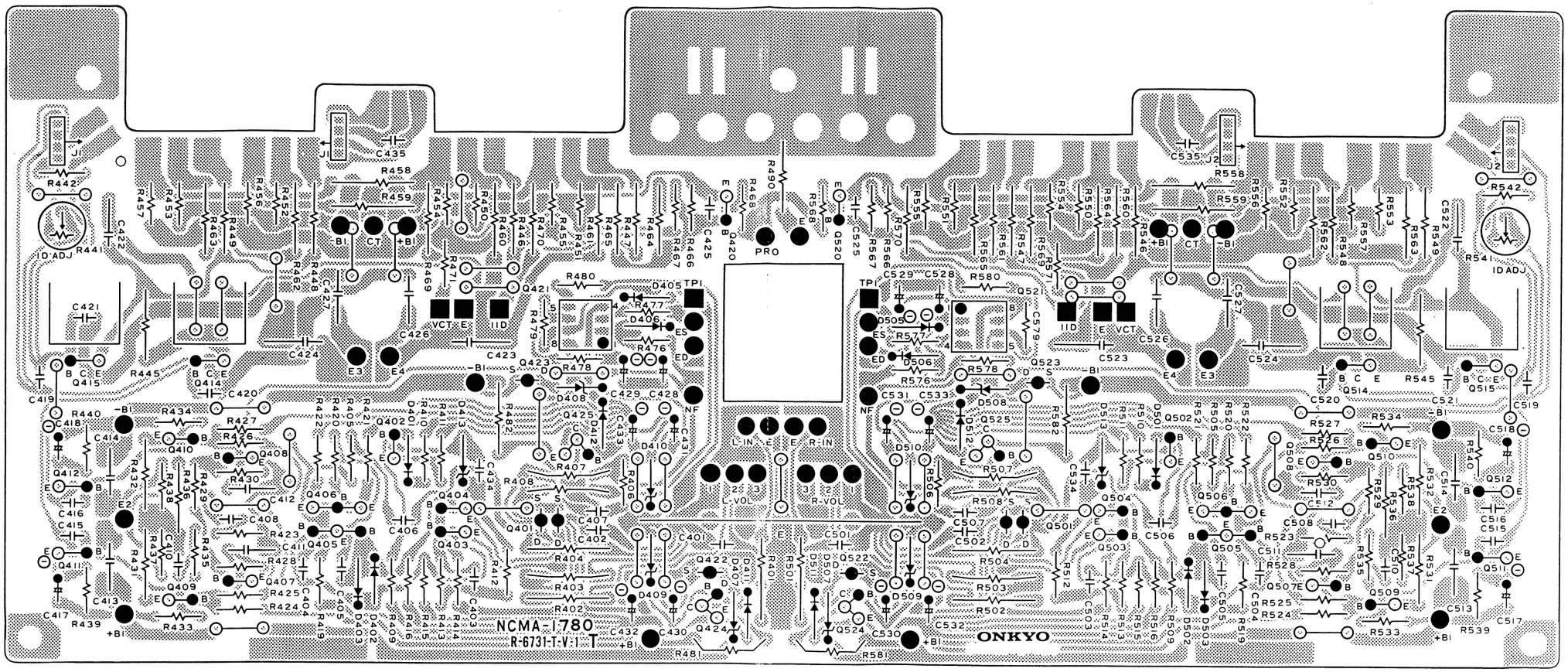
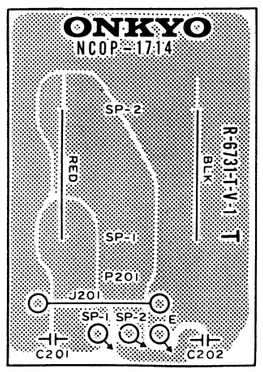
PRINTED CIRCUIT BOARD VIEW FROM COMPONENT SIDE

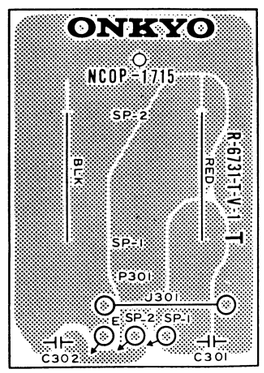
NAMA-1780



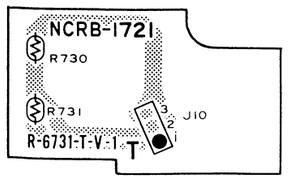
NAOP-1714



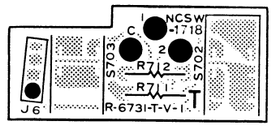
NAOP-1715



NARB-1721

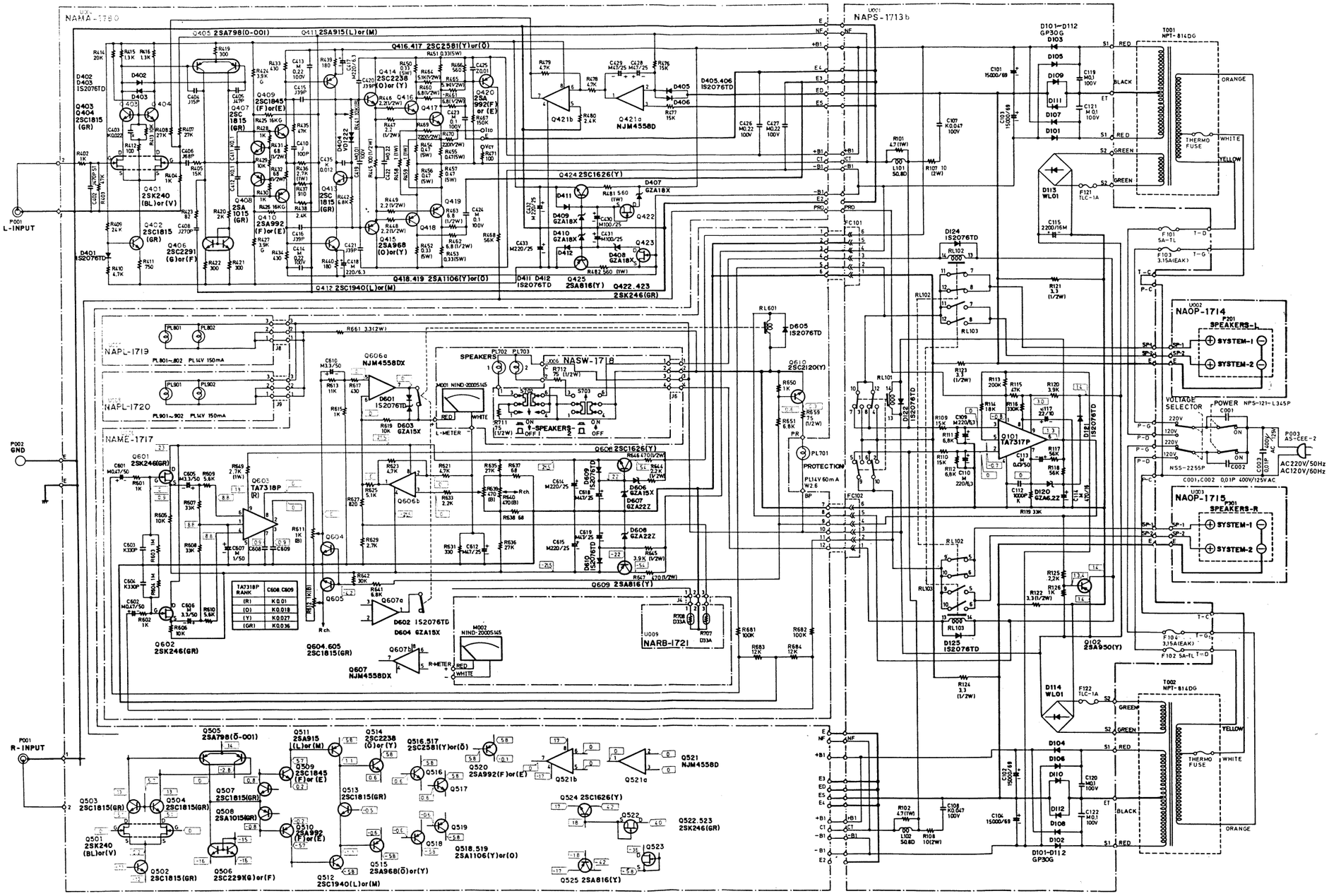


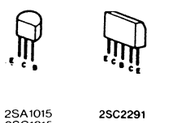
NASW-1718

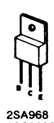


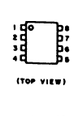
SCHEMATIC DIAGRAM

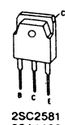
120V/220V model

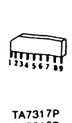


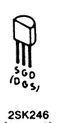












NOTES:
- ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M.) (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

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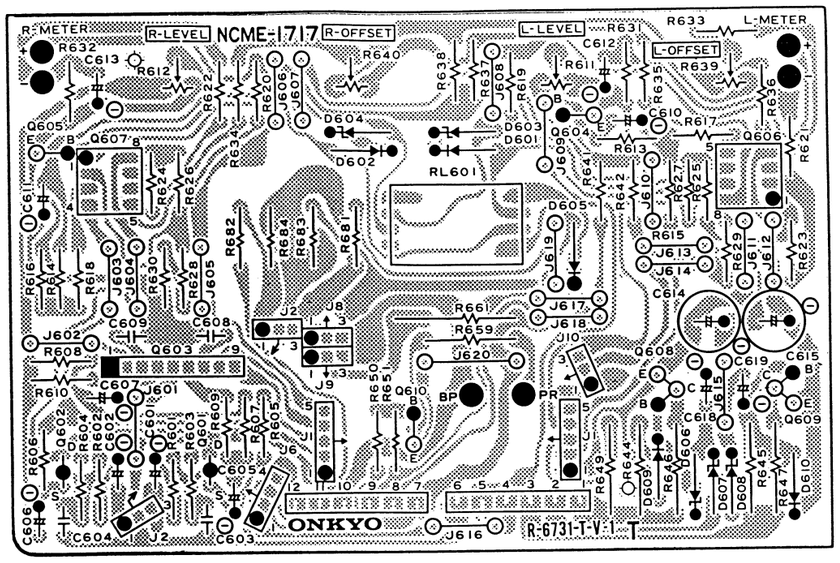
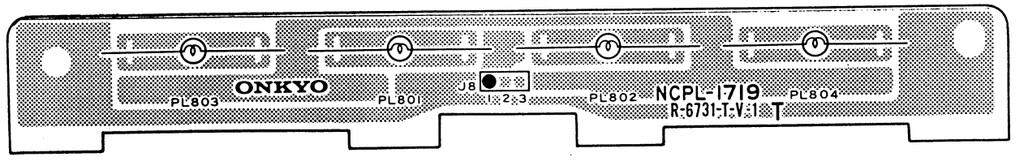
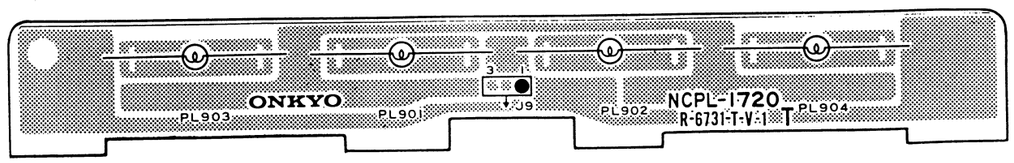
NAME-1717



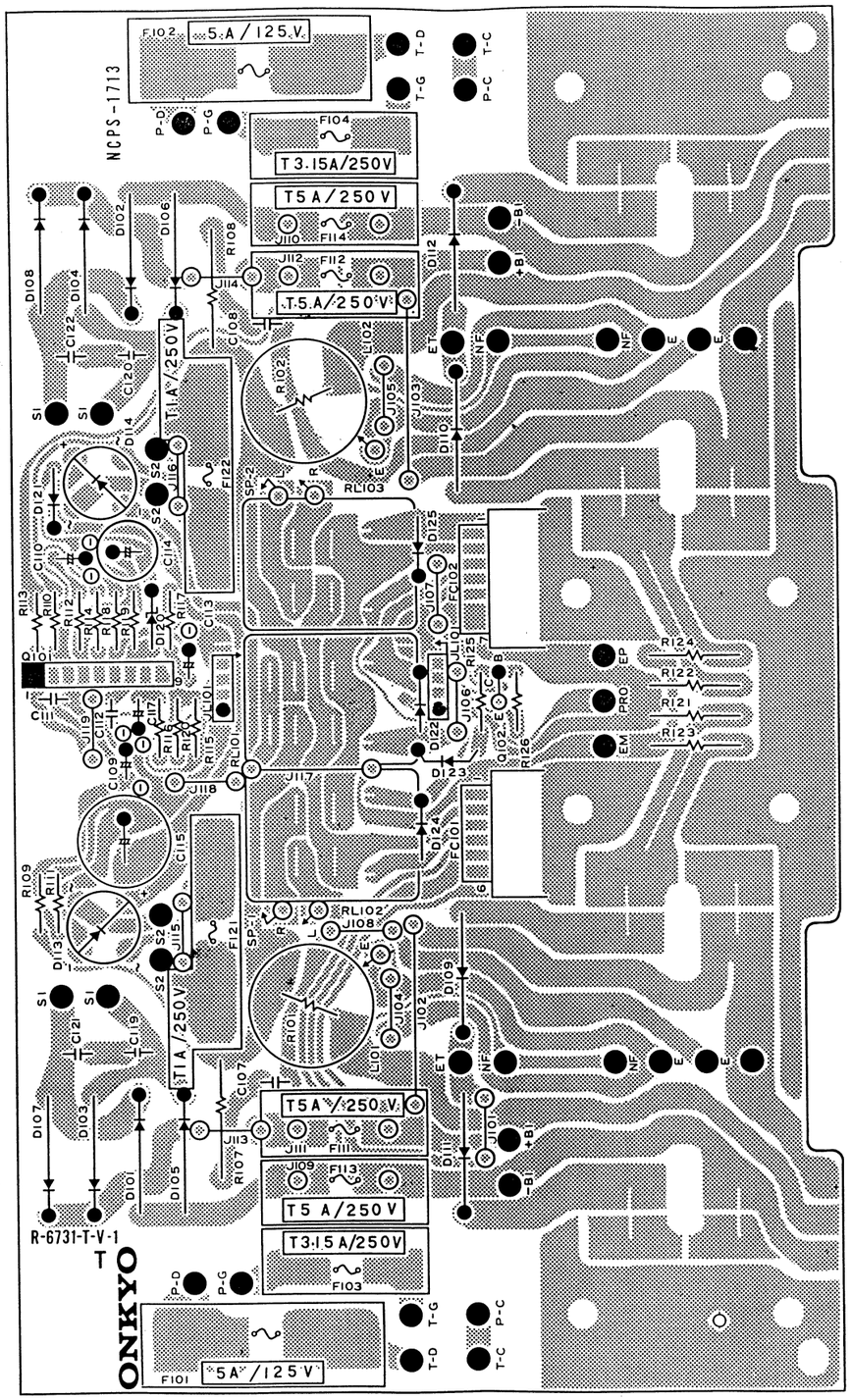
NAPL-1719



NAPL-1720

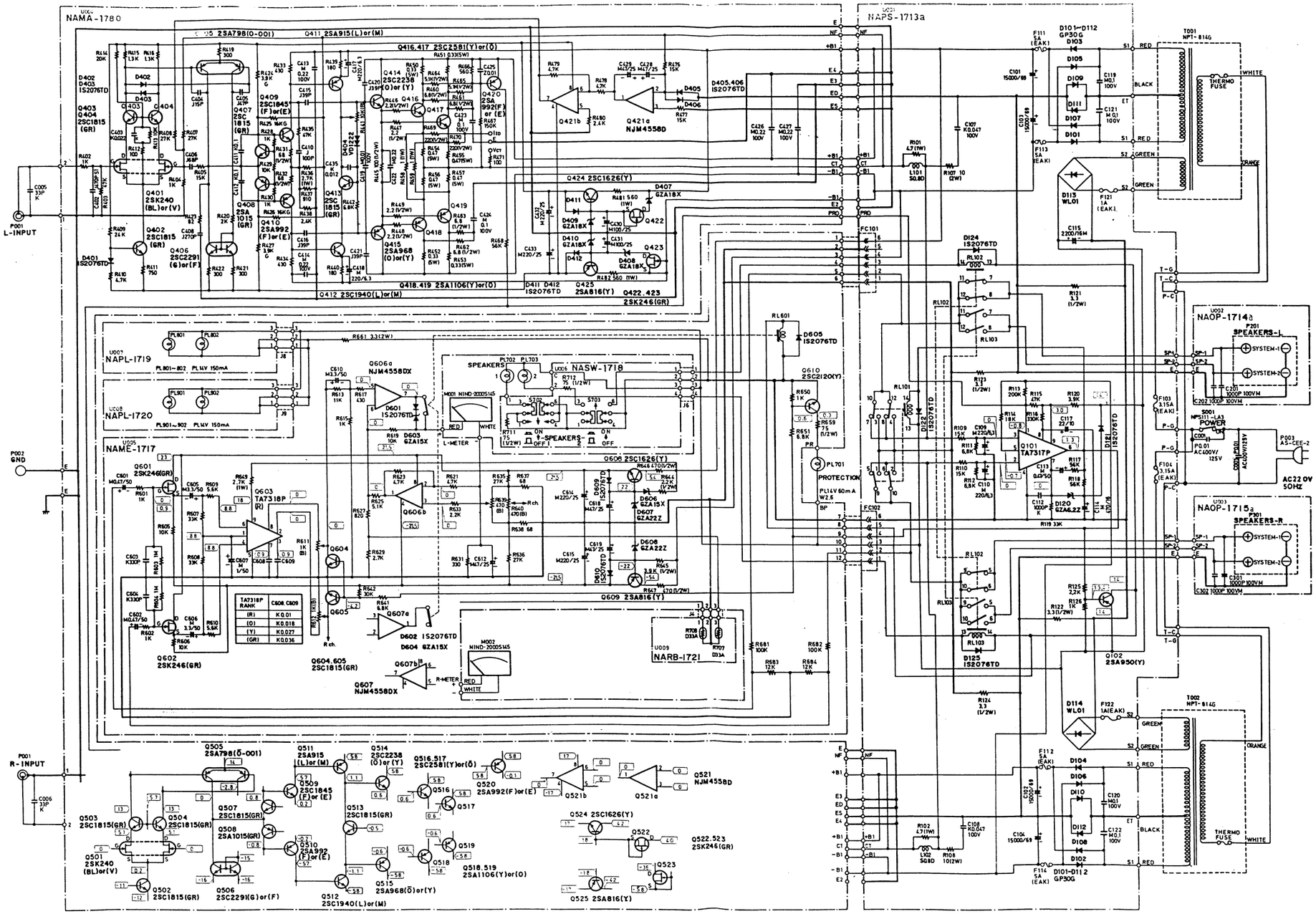


NAPS-1713



SCHEMATIC DIAGRAM

220V model



2SA1015
2SC1815
2SA992
2SC1845
2SA950
2SC2120

2SC2291

2SA798

2SD882

2SA915
2SC1940

2SA968
2SC2238
2SA816
2SC1626

NJM4558

2SC2581
2SA1106

TA7317P
TA7318P

2SK246
(2SK117)

2SK240

NOTES:
- ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (⊕⊖) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M.) (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

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